Research Office
Long Range Planning Division
505 Deaderick Street, Suite 900
Nashville, TN 37243
TDOT.Research@tn.gov

Research Project Title

100% Recycled Mixtures Using Cold In-Place Recycling (CIR), Hot In-Place Recycling (HIR) and Cold Central Plant Recycling (CCPR)

Purpose of the Project

The purpose of the project is to better balance the generation of asphalt millings in Tennessee and promote use of recycled asphalt, and ultimately help maintain a more sustainable highway system, including: 1) Explore the potential of adopting CIR, HIR and CCPR in Tennessee; 2) Evaluate the properties and performance of cold recycled asphalt mixes; 3) Provide recommendations to TDOT specification for implementation of CIR, HIR and CCRP in Tennessee.

Scope and Significance

Although TDOT has made efforts to increase the use of reclaimed asphalt pavement (RAP) in its highway construction, there is still a surplus of RAP ended up in stockpiles. Previous TDOT-UT joint research has established that current TDOT limits on recycled material percentages are already near their maximums. CIR, HIR and CCPR provide an alternative to using excessive RAP stockpiles in a beneficial application.

The scope of the research work includes: 1) To complete a synthesis of literature review on CIR, HIR and CCPR and DOT survey on these 100% recycling technologies in the US, especially in the Southeastern region; 2) To perform field testing and monitor pavement performance of 100% asphalt recycling projects; 3) To conduct a series of laboratory tests on asphalt millings, raw materials, and 100% recycled asphalt mixtures to test their properties and performance; 4)To conduct a cost-effectiveness analysis.

Expected Outcomes

This research will significantly benefit the economy of the state of Tennessee through the adoption of 100% asphalt recycling technologies: 1) Recommendations on whether CIR, HIR or CCPR are applicable to the Department's program; 2) If applicable, recommended material, design, and construction specifications for CIR, HIR or CCPR; 3) If applicable, more RAP will be consumed; 4)Significant cost saving for rehabilitation of asphalt pavements; 5) Beneficial to the environments in Tennessee due to the use of more RAP and 100% asphalt recycling technologies. The results from the research will documented in the reports and presented to TDOT staff and engineers. Based on the results and findings, recommendations will made to TDOT specifications for future implementation. This will facilitate the acceptance and use of 100% asphalt recycling technologies in Tennessee and increase the use of RAP/RAS in TDOT's highway construction.

Time Period

The time period for the project is January 28, 2019 to November 30, 2020.

Contact Information

Principal Investigator (PI):	**TDOT Lead Staff:**
Name: Baoshan Huang	Name: Matthew Chandler
Department: Civil & Environmental Engineering	Division: Materials and Tests
University: University of Tennessee - Knoxville	Phone: 615.840.2918
Address: 851 Neyland Dr., Room 419	Email: Matthew.Chandler@tn.gov
Phone: 865.974.7713	
Email: bhuang@utk.edu	